

## REMARKS / ARGUMENTS

Claims 1, 3-21, 23-46, and 48, and 50-52 remain in this application. Claims 1, 48, and 50 are currently amended. Claims 22 and 49 are currently cancelled. Claims 51 and 52 are new. Claims 15-18 and 34-45 have previously been withdrawn. Claims 2 and 47 have been previously cancelled. Claims 3, 10, and 31 have been previously amended. Claims 4-9, 11-14, 19-21, 23-30, 32, 33, and 46 are original.

Claims 1, 48, and 50 have been amended to better define the invention.

The phrase "wherein the chemical to be purified comprises a chemical selected from the group consisting of a hydrogen peroxide solution, hydrofluoric acid, hydrochloric acid, acetic acid, ammonium hydroxide solution and combinations thereof" has been deleted from claims 1, 48, and 50, since, as the Examiner points out, these introduce an intended use and are not structural elements or limitations.

The phrase "wherein the purified chemical has a cationic concentration of less than or equal to about 1 ppb per cationic contaminant, and an anionic concentration of less than or equal to about 10 ppb per anionic contaminant" has been deleted from claims 1, 48, and 50, since, as the Examiner points out, these introduce an intended use and are not structural elements or limitations.

The phrase "other than a membrane, wherein said purification material is selected from the group consisting of polystyrene and polyacrylic resins" has been added to further define the purification material. Support for this can be found in the Specification at

- Page 20, Paragraph 63:  
"the purification material preferably includes an anionic exchange resin such as, for example, DOWEX

MONOSPHERE A550 UPN (polystyrene - DVB gel, quaternary ammonium, 1.0 eq. OH<sup>-</sup>/l) nuclear grade, available from Dow, or AMBERLITE IRA 958, available from Rohm and Haas (polyacrylic - DVB macroporous, quaternary ammonium 0.8 eq. Cl<sup>-</sup>/l). Other anionic resins that are known in the art can be used.”

- Page 21, Paragraph 64:

“the purification material preferably includes a cationic exchange resin, such as, for example, DOWEX MONOSPHERE C650 UPN (polystyrene - DVB gel, sulfonic, 1.9 eq. H<sup>+</sup>/l), available from Dow, or IRA 963 available from Rohm and Haas. Other cationic exchange resins that are known in the art can be used.”

- Page 22, Paragraph 68:

“Suitable materials for removing organic contaminants include, for example, AMBERLITE XAD-4 and AMBERSORB 563, available from Rohm and Haas. Other organic contaminant removal resins that are known in the art can be used. “ It is well known to those of ordinary skill in the art, that AMBERLITE XAD4, from Rohm and Hass, is a polystyrene resin.

### **Claim Rejections Under 35 U.S.C. § 103**

Claims 1, 3-14, 19, 23-33, 46 and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haslett '004. The above-referenced amendments have rendered this rejection moot.

Haslett '004 has a grant date of August 26, 1930.

In contrast, polyacrylic polymers were not commercialized until 1927. It is well known that they were initially used as *Acryloid* and *Pexigum*, and as the intermediate layer for automotive safety glass (*Luglas*). Full scale production of polyacrylic polymers did not begin until 1931. See generally *Physical Sciences Information Gateway Materials Timeline*, and *Plastiquarian excerpt on Rohm & Haas development of acrylate polymers*. One of ordinary skill in the art, at the time that Haslett '004 was conceived, would have not known to use polyacrylic resins as an equivalent for the claimed zeolite.

It is well known that polystyrene was not invented until 1930, and the first polystyrene resins were not developed until the mid 1940's. See *The Development of a New Generation of Ion Exchange Materials for Industrial Application*, *ATSE Focus No. 92*, May/June 1996, by Dr. Frank Lawson, *Australian Academy of Technological Sciences and Engineering*. One of ordinary skill in the art, at the time that Haslett '004 was conceived, would have not known to use polystyrene resins as an equivalent for the claimed zeolite.

Claims 49 and 50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haslett '004 in view of Moses '826. For the reasons discussed above, the above-referenced amendments have rendered this rejection moot.

Moses '826 discloses a water softening and filtering system that depends on multiple active layers. The disclosed and claimed method and apparatus requires layers of activated carbon, organic cation resin, zeolite, and quartz filtration sand. It is clearly stated that each of these layers is necessary to this invention. The activated carbon layer removes organic compounds, chlorine, and various gases. The ion exchange resin removes Calcium and magnesium ions from the water. The zeolite softens the water and filters out particles greater than 20 microns in size. The quartz filtration sand acts as a flow distribution system. See generally *Column 2, Lines 24 through 59*.

Moses '826 notes the failings of using an ionic resin alone alone. For example, should "organic resin cationic exchange medium" be used alone, the resulting water may be turbid. *Column 2, Lines 8 through 21*. The limitations of

Zeolite alone are also discussed, noting that Zeolite can not be regenerated, and thus must be replaced after it is spent. It is noted that Zeolite alone is not able to remedy problems with odor, taste and color of water. *See generally column 1, line 50 through column 2, line 7.* Moses '826 teaches that multiple media must be used together to fully purify water. In contrast, the instant invention does not require a carbon layer, a zeolite layer, or a sand layer. Thus, one of ordinary skill in the art would find that Moses '826 teaches away from both Haslet '004 and the instant invention.

Claims 1, 3-14, 19, 20, 23-33, 46 and 48-50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Crofts et al. '665. Crofts et al. '665 teaches the use of a membrane that contains ion exchange resins. The above-referenced amendments render this rejection moot.

Claims 21 and 22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Crofts et al. '665 in view of Casolo '648. The Examiner notes that:

"Casolo is relied upon only for the teachings of utilizing a plurality of groups of cartridges (see col. 3, line 8; and col. 4, line 49) connected in parallel, wherein each group comprises cartridges connected in series (see Fig. 2), and for the specific purification materials recited in claim 22, not for any pH adjustment." (*February 3, 2004 Office Action*).

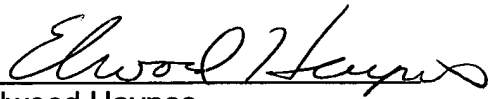
Claim 22 is currently cancelled, thus rendering that rejection moot. As discussed above, one of ordinary skill in the art would not find that Crofts et al. '665 teaches the present invention. Casolo '648 fails to remedy these deficiencies. The above-referenced amendments render this rejection moot.

## CONCLUSION

In view of the current amendments, the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited.

Should the Examiner believe that a telephone call would expedite prosecution of the application, he is invited to call the undersigned attorney at the number listed below.

Respectfully submitted,

  
Elwood Haynes  
Registration No. 55,254

Date: April 5, 2004  
Air Liquide  
2700 Post Oak Blvd., Suite 1800  
Houston, Texas 77056  
(713) 624-8956 Phone  
(713) 624-8950 Fax

**CERTIFICATE OF MAILING UNDER 37 CFR 1.8(a)**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5<sup>th</sup> day of April, 2004.

  
\_\_\_\_\_  
Stacy Forte